Attorney's Docket No. 033679-040

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	
Kenneth G. Noggle	Group Art Unit: 3722
Application No.: 09/782,915	Examiner: Dana Ross
Filed: February 13, 2001	Appeal No.:
For: CUTTING TOOL ADJUSTMENT DEVICE	

APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated November 18, 2004 (Paper No. 20041107), finally rejecting claims 1-7, which are reproduced as the Claims Appendix of this brief.

☐ A check covering the ☐ $250.00 (2402) ☒ $500.00 (1402) Government fee is filed herewith.

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11/21/2005 JADD01 00000110 09782915
02 FC:1402 500.00 OP

I. Real Party in Interest

The present application is assigned to VALENITE INC., Madison Heights, Michigan.

II. Related Appeals and Interferences

The Appellant's legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-7 stand rejected over the prior art.

Claims 20-32 have been allowed (see page 5, section no. 5 of the final rejection).

IV. Status of Amendments

A Request for Reconsideration filed March 18, 2005 in response to the Final Rejection was considered by the examiner.

V. Summary Claimed Subject Matter

The present invention relates to a device for adjusting the position of a cutting insert that is adjustably secured in a pocket disposed in a holder, such as a tool body or a cartridge.

It is conventional to provide an adjusting device wherein the insert is adjusted by a wedge-shaped member which, when actuated by a screw, is caused to slide along a flank of the insert and thereby displace the insert. However, the sliding contact between the wedge and the insert produces an irregular sticking friction which results in an irregular movement of the wedge.

That problem is avoided by another conventional adjusting device in the form of a sleeve or pin having a slotted end which is expandable by a wedging screw, as shown in Fig. 7 (which depicts an adjusting device disclosed in the Basteck patent of record). The sleeve is force fitted into the tool body, and the screw engages an internal thread of the sleeve to draw a tapered head of the screw into the sleeve to deform the upper portion of the sleeve. One drawback of this device is that as the screw is advanced in the sleeve, rotational and linear forces are exerted on the sleeve which can eventually degrade the force fit.

The present invention avoids such a shortcoming by providing an intermediate member (e.g., a sleeve 50) which is actuated by a wedging device (e.g., a conical art of a screw 70) that is attached directly to the holder rather than to the intermediate member. That is, the thread 74 of the wedge is screwed into the tool body as disclosed at page 15, lines 13-15 of the specification.

Thus, with reference to the embodiment of Figs. 1-4A, the invention involves a device for adjusting the position of a cutting insert 14 adjustably secured in a pocket 20 disposed in a holder (or tool body) 12 comprising:

a cavity 44 in said holder, at least a portion of said cavity being contiguous with said pocket;

an intermediate component 50 separate from said holder and disposed within said cavity, said intermediate component comprising an external peripheral surface 58 and at least one expansion mechanism (slots 54), said external peripheral surface engaging the insert at said contiguous portion; and

a wedging device 70 movably attached directly to said holder via thread 74 and engaging the intermediate component such that actuation of the wedging device results in expansion of the intermediate component in a direction substantially parallel to a desired direction of adjustment of the insert (e.g., to the left in Figs. 1 and 2).

VI. Grounds of Rejection to be Reviewed on Appeal

At issue is whether claims 1-7 are obvious over Basteck U.S. Patent 5,391,023 in view of Matthews U.S. Patent 3,703,117.

VII. Argument

Claim 1 recites a combination of features, including an intermediate member that is separate from the holder and a wedging device which is directly attached to the holder.

For example, the wedging screw 70 Is attached by threads 74 directly to the tool body 12 (see pg. 15, lines 13-15). In contrast, Bastek's wedging screw 37 is connected directly to the pin or sleeve 32 (not to the holder). As pointed out in paragraph no 4 of the present application,

> [t]he stop pin [of Bastek] is force fitted into the tool body and the screw engages an internal thread of the pin to draw the tapered head into the conical internal passage of the stop pin. Because the screw engages the pin, and not the tool body, the pin must be retained in the tool body by a force fit or other means independent of the screw. One drawback of this device is that as the screw is advanced in the pin, rotations and linear forces are exerted on the stop pin which over time can degrade the force fit. (emphasis added)

Claim 1:

That problem is avoided by the direct connection of the wedging device to the holder as recited in claim 1. It was asserted in the Final Rejection that:

> Basteck teaches a cavity 31 (col. 2, lines 60-63, fig. 2) in a holder 12 (col. 2, lines 26-29, fig. 2) at least a portion of the cavity 31 contiguous with the pocket 17 containing the insert 18 (col. 2, lines 60-63, fig. 2), with an intermediate component 32 separate from the holder 12 and disposed within the cavity 31, the intermediate component 32 comprising an external peripheral surface 33 (col. 2, lines 0-63) and at least one expansion mechanism 44 (col. 3, lines 16-18), the external peripheral surface 33 engaging the insert 18 at the contiguous portion (col. 3, lines 11-14) and a wedging device 37 engaging the intermediate component 32 (col. 3, lines 1-7) such that actuation of the wedging device 37 results in expansion of the intermediate component 32 in a direction substantially parallel to a desired direction of the adjustment of the insert 18 (col. 3, lines 16-30).

* * *

> Matthews teaches an expansion mechanism in a cavity of a tool holder 4, the mechanism includes an expansion device made of arms 22 and 20, a wedging device 26 (fig. 2).

* * *

> Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the wedging device and holder as taught by Bastek to include the wedging device movably attached directly to the holder as taught by Matthews to threadedly engage the holder for the purpose of ensuring that the cutting insert is effectively wedged-locked against accidental removal from the tool holder and to provide maximum strength and rigidity (see Matthews, col. 1, lines 47-51 ad col. 4, lines 4-5, for example).

It is submitted that it would not have been obvious to modify *Basteck* in view of *Matthews* by making *Basteck's* wedging device 37 directly attached to the holder 12. *Basteck* is attempting to make precision adjustments of a cutter 18.

> The object of the invention is to provide a machine reamer of the type described that permits sensitive, accurate adjustment of the cutter in the longitudinal direction of the slot. (*Basteck*, column 1, lines 28-31 – emphasis added)

Securement of the cutter 18 is achieved by a different device, namely a clamping claw 19.

> In the guide slot 17, an elongated lamina-like cutter 18 is guided and is fastened by means of a clamping claw 19. (*Basteck*, column 2, lines 35-37)

Matthews employs a wedging assembly 20, 26 for the purpose of securing a cutter.

> The knife is shown secured in the trough 2 by means of a plurality of clamps 20. (*Matthews*, column 3, lines 1-2)

Thus, the wedging assembly 20, 26 of *Matthews* performs the function of *Basteck's* clamping jaw 19, not the function of *Basteck's* wedging assembly 32, 37. That difference is important because it leads to the reason why it would not have been

obvious to modify *Basteck* in view of *Matthews* in the manner asserted in the Official Action.

In that regard, it is important to note that the function which *Basteck* is attempting to achieve is to accurately and predictably convert axial movement of the wedging device 37 into radial movement of the pin head 44.

> A second mechanism is formed by the conical surfaces expanding the pin head 44, whereby the afore-said axial movement is once again stepped down into a radial movement of the regions of the pin head 44. Very accurate and sensitive longitudinal adjustment of the cutter 18 is thus possible. (*Basteck*, column 3, lines 25-30 – emphasis added)

In order to achieve that conversion in a predictable way, it is required that the pin head be held stationary while the wedging device 37 is tightened down. That requirement is met in *Basteck*, i.e., it is ensured that the pin head will not be displaced during the adjusting procedure, because the wedging device attaches directly to the stop pin 32. Any downward axial force applied by the head of the wedging device against the stop pin 32 will be totally countered by an upward axial force applied by the screw thread 38 of the wedging device 37 against the stop pin 32. Thus, the wedging device 37 will not generate any net axial forces tending to axially displace the frictionally-held stop pin, so axial movement of the stop pin 32 will be converted directly into radial movement of the pin head.

The ability to achieve sensitive accurate adjustment of the cutter in that fashion would be destroyed if *Basteck's* wedging device 37 were directly attached to the holder. The reason is that as the wedging device is screwed down into the holder, the head of the wedging device would apply a downward axial force to the stop pin, tending to axially displace the stop pin downwardly, thereby displacing the cutter 18 independently of any radial expansion of the pin head. Even if there should occur a simultaneous expansion of the pin head 44, there will no longer take place the accurate conversion of axial movement of the wedging device into radial movement of the pin head needed to achieve *Basteck's* sensitive, accurate adjustment of the cutter.

To reiterate, *Matthews* does not employ his wedging assembly for the purpose of adjusting the position of a cutter, so it is not seen that an artisan would be motivated to modify *Basteck's* cutter-adjusting wedge assembly in view of *Matthews*, especially since such a modification would destroy *Basteck's* ability to make sensitive accurate adjustments of the cutter.

On page 5 of the final rejection it was asserted that:

> "Examiner disagrees with Applicant's assertion that "the ability to achieve sensitive accurate adjustment of the cutting ... would be destroyed if Basteck's wedging device were directly attached to the holder". Applicant asserts that "the head of the wedging device would apply a downward axial force to the stop pin, tending to axially displace the stop pin downwardly".
>
> Applicant appears to be arguing a scenario where Basteck's wedge device is screwed to the point that the intermediate component of Basteck is pushed beyond its intended use of adjusting an insert."

The point which applicant was attempting to make was that Basteck's invention relates to the ability to make very sensitive adjustments of the cutter which is accomplished by converting that axial movement of the screw 37 directly into radial movement of the pin head. That is, the operator can rely on the fact that a certain turning of the screw will result in a predictable displacement of the insert.

> The turning of the countersunk head screw 37 is converted into an axial movement of the countersunk head 39 (relative to the axis of the pin) ...
>
> A second wedge mechanism is formed by the conical surfaces expanding the pin head 44, whereby the afore-said axial movement is once again stepped down into a radial movement of the regions of the pin head 44. Very accurate and sensitive longitudinal adjustment of the cuter 18 is thus possible. (Basteck, column 3, lines 20-30)

One reason that such precise, predictable adjustments are ensured is the fact that the screw 37 is attached directly to the pin 32. If, instead, the screw were attached directly to the holder, there is a serious risk that such precision could not be attained, for the following reason. As the screw 37 is screwed-down with the screw

head in contact with the pin head 44, the screw head will radially expand the pin head (and thereby adjust the cutter) if the pin remains axially stationary. However, since the screw is directly secured to the holder, the screw head will also apply a considerable axial force to the pin 32 (in contrast to the case where the screw is directly connected to the pin). That makes it more likely that axial movement of the pin will occur either instead of, or simultaneously with, radial expansion of the pin head, thereby eliminating the predictable sensitive cutter adjustments intended by Basteck. Consequently, unless there was a good reason to directly connect the screw to the holder, no artisan would be motivated to do it.

The final rejection attempted to present such motivation as follows:

> Basteck teaches that there is a problem with the wedging device coming loose. Matthews teaches it is well known in the art to extend a wedging device into the tool holder to resolve this issue. Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the wedging device and holder as taught by Bastek to include the wedging device movably attached directly to the holder as taught by Matthews to threadedly engage the holder for the purpose of ensuring that the cutting insert is effectively wedge-locked against accidental removal from the tool holder and to provide maximum strength and rigidity. (Final Rejection, page 5)

However, applicant disagrees. Basteck explains that the reason why the screw may become loose is due to a weak spring force exerted by the pinhead against the screw head which is insufficient for preventing rotation of the screw.

> The weakening of the pin head 44 should be so adjusted that the spring force by which the countersunk head 39 is clamped gives rise to sufficient frictional resistance to prevent unintentional loosening of the countersunk head screw 37. (Basteck, column 3, lines 45-48).

That problem will <u>not</u> be eliminated simply by directly attaching the screw to the holder, because the strength of the spring force applied by the pinhead to the screw head will not be affected by changing the location of attachment of the screw. The reason why Matthews' arrangement secures the screw 26 against loosening is because the screw creates a wedge locking action, i.e., the screw head, the wedge

210, and the cutter 5 are strongly jammed (clamped) together between the fixed walls of the holder 4. That would not occur in Basteck, even if Basteck's screw 37 were directly attached to the holder, because Basteck's screw is not functioning to lock the cutter in place, but is rather is functioning to make precision adjustments of the cutter. (In Basteck, the cutter is secured in place by a clamping claw 19.) The only time that any jamming (clamping) of Basteck's screw head could occur is when the pin head is radially expanded so far that the pin head (i.e., the left side of the pin head in Fig. 2) contacts the wall of the bore 45. However, as Basteck points out in column 3, lines 31-37, that contact prevents further expansion of the pin, i.e., further cutter adjustment is prevented. Accordingly, it is submitted that Matthews provides no motivation for directly attaching Basteck's screw to the holder, and the rejection of claim 1 should be withdrawn.

Claim 6:

Regarding dependent claim 6, that claim recites that an expansion element intersects each of two opposite end faces. That is, slots 54 intersect the top end face 62 and the now-depicted opposite bottom end face in the disclosed preferred embodiment. Basteck does not disclose slots formed in the opposite end faces of the screw 37, but rather only in the top face. Even if the outer conical surface of the head 39 were considered to constitute an end face, it would constitute only one, continuous conical end face, not opposite end faces as recited in claim 6. Accordingly, it is submitted that claim 6 distinguishes patentably over Basteck for that reason.

It was also mentioned in the final rejection that Matthews teaches an expansion element that runs the length of intermediate component, the expansion element intersecting the top face and bottom face. However, if the expansion elements 47 of Basteck were extended all the way through the member 37 from top to bottom thereof, as in Matthews, then the member 32 would be split in half and thus rendered inoperative.

CONCLUSION

In light of the foregoing arguments, it is requested that the rejection of claims 1-7 be withdrawn and the application be allowed.

Respectfully submitted,

Buchanan Ingersoll PC

Date November 18, 2005 By: _____

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VIII. CLAIMS APPENDIX

The Appealed Claims

1. (Previously Presented) A device for adjusting the position of a cutting insert adjustably secured in a pocket disposed in a holder, comprising:

a cavity in said holder, at least a portion of said cavity being contiguous with said pocket;

an intermediate component separate from said holder and disposed within said cavity, said intermediate component comprising an external peripheral surface and at least one expansion mechanism, said external peripheral surface engaging the insert at said contiguous portion; and

a wedging device movably attached directly to said holder and engaging the intermediate component such that actuation of the wedging device results in expansion of the intermediate component in a direction substantially parallel to a desired direction of adjustment of the insert.

2. (Original) The device of claim 1, wherein said expansion mechanism comprises slots and a tapered portion disposed on a first region of an internal peripheral surface of said intermediate component.

3. (Previously Presented) The device of claim 1 wherein said wedging device comprises a conical wedge.

4. (Previously Presented) The device of claim 3 wherein said wedging device includes an adjustment screw threadingly engaged to the holder.

5. (Original) The device of claim 1 wherein the intermediate component further comprises a plurality of end faces, each end face being intersected by at least one of said expansion elements.

6. (Previously Presented) the device of claim 1 wherein the intermediate component further comprises opposite end faces facing generally parallel to a direction of movement of said wedging device, each end face being intersected b y at least one expansion element.

7. (Original) the device of claim 1 wherein actuation of the wedging device causes expansion of the intermediate component along substantially the entire length of said component.